UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,331	08/31/2007	Noriya Hayashi	MTU.0022US	5747

21906 7590 03/09/2009

TROP, PRUNER & HU, P.C.
1616 S. VOSS ROAD, SUITE 750
HOUSTON, TX 77057-2631

EXAMINER	
PAK, HANNAH J	

ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
03/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/588,331	HAYASHI ET AL.	
	Examiner	Art Unit	
	Hannah Pak	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/12/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. All outstanding rejections, except for those maintained below, are withdrawn in light of applicants' amendment filed on 12/03/2008.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action. In addition to the limitations made to claim 7, other limitations not previously presented also have been introduced into claims 1, 2, 12 and 13. It is in light of those latter limitations that it is proper to make a final.

3. The new grounds of rejection set forth below are necessitated by applicants' amendment filed on 12/03/2008. Hence the final is warranted and is proper.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-2 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The applicants have amended the claims to include the phrases, "a refractory index having higher density than that of the hydrogenated bisphenol resin" and "a density-increasing agent having higher density that of the refractory material" recited in

claims 1 and 2. These phrases fail to satisfy the written description requirement of 35 USC 112, first paragraph since there are no support for these phrases in the application as originally filed, *see MPEP § 2163*. While there are support for the example applications including "density-increasing agent 3 having a higher density than that of the refractory material 2" and "refractory material 2 may have slightly higher density and a slightly lower content as compared with the resin component 1" on Page 19, lines 21-25 of the specification, the specification does not explicitly express any and all refractory materials, density-increasing agent, or bisphenol resin having the claimed functional properties. Accordingly, these phrases are not reasonably conveyed to one of ordinary skill in the art.

Claim Rejections - 35 USC § 103

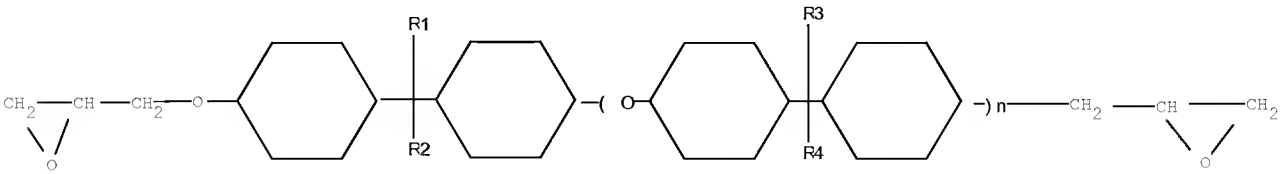
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-6 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (Machine Translation of JP 2003-50295) in view of Anayama et al. (EP 0 628 968).

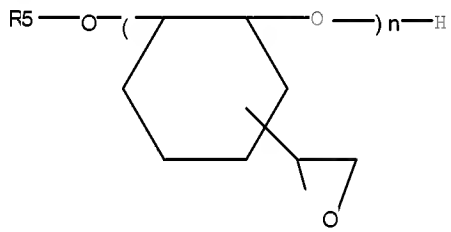
With respect to claims 1-5, Hayashi et al. disclose a neutron shielding material composition useful for cask and container applications, comprising a hydrogenated bisphenol epoxy resin, a boron compound, and a hardening (or curing) agent

component having at least one or more ring structures and a plurality of amino groups (Paragraphs 1-2, 9 and 26). Hayashi et al. further disclose the hydrogenated bisphenol epoxy resin having the structural formula:



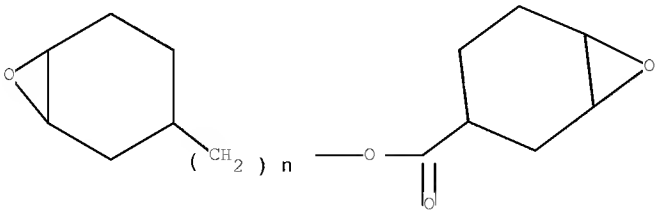
wherein R1-R4 are selected from a group comprising CH_3, H, F, Cl, and Br, and n is from 0 to 2 (Compare Paragraph 8, Formula 9 of Hayashi et al. with claim 2, Formula 1). Hayashi et al. also disclose the neutron shielding material composition containing one or more compounds with the following structural formulae **(a-d)**:

(a)



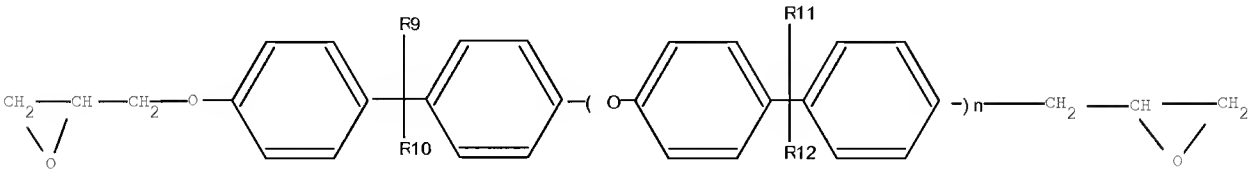
wherein R5 is an alkyl group of 1-10 or H, and n is from 1 to 24 (Compare Paragraph 8, Formula 10 of Hayashi et al. with claim 3, Formula 2).

(b)



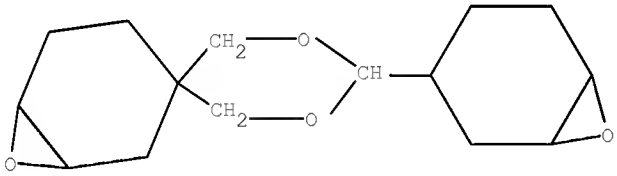
wherein n is from 1 to 8 (Compare Paragraph 8, Formula 11 of Hayashi et al. with claim 2, Formula 3).

(c)



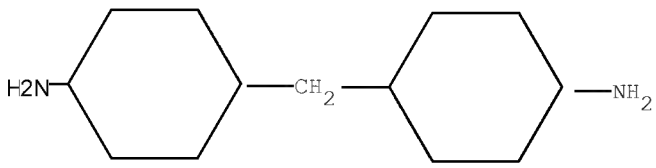
wherein R9-R12 are independently chosen from the group which consists of CH_3, H, F, C, and Br, and n is from 0 to 2 (Compare Paragraph 8, Formula 12 of Hayashi et al. with claim 2, Formula 6).

(d)



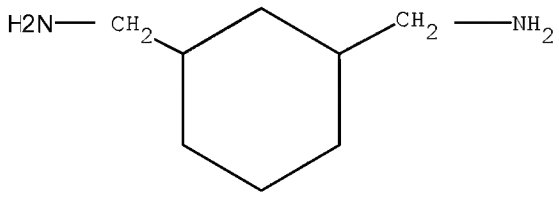
(Compare Paragraph 8, Formula 13 of Hayashi et al. with claim 2, Formula 9).

Furthermore, Hayashi et al. disclose the hardening (curing) agent component comprising the compound having the structural formula (Compare Paragraph 8, Formula 14 of Hayashi et al. with Claim 4, Formula 4):



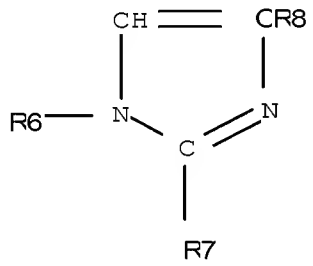
The curing agent component further contains additional compounds having the structural formulae **(a1-b1)**:

(a1)



(Compare Paragraph 8, Formula 15 of Hayashi et al. with Claim 5, Claim 5).

(b1)



wherein R6-R8 each is independently an alkyl group of 1-18, or H (Compare Paragraph 8, Formula 16 of Hayashi et al. with Claim 5, Claim 8):

In addition, Hayashi et al. teach employing fillers and refractory materials having at least one of magnesium hydroxide and aluminum hydroxide as required by claims 6-8 (Paragraphs 28-29).

Hayashi et al. do not specifically mention employing density-increasing agents as required by claims 1 and 9.

However, Anayama et al. also disclose employing high density inorganic materials, corresponding to the claimed density-increasing agent, comprising metal powders, such as W, Mn, Fe, and Mn, in a neutron shielding material composition to

obtain a higher and more effective shielding effect on neutron rays (Page 3, lines 5-39). Anayama et al. further disclose that the high density inorganic materials will also produce shielding materials having optimum properties, such as greater mechanical strength and heat resistance (Page 10, liens 1-12).

Given the above teachings, it would have been obvious to one of ordinary skill in the art to employ the density-increasing agents taught by Anayama et al. in a neutron shielding composition of Hayashi et al. to obtain optimum shielding materials.

Regarding claims 1 and 2, Hayashi et al. and Anayama et al. teach their refractory materials, bisphenol resins, and density-increasing agent are made of the same materials to those claimed. Anayama et al. also teach that the density of the density-increasing agent has an overlapping amount with that claimed. Since the refractory materials, bisphenol resins, and density-increasing agents are made of identical materials to those claimed, there is a reasonable basis to believe that the refractory material has a higher density than that of the bisphenol resin, and density-increasing agent has a higher density than that of the refractory material. In any event, the densities of the refractory materials and bisphenol resins are well known to one of ordinary skill in the art. According to MPEP § 2112.01 [R-3], II,

> "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present."

As to claim 9, Hayashi et al. and Anayama et al. do not mention the specific density of the density-increasing agent. However, Anayama et al. disclose the high density inorganic material (corresponding to the claimed density-increasing agent)

having metal powders with a density of at least 2.0 g/cm^3 or above, which overlaps with the claimed range (5.0 -22.5 g/cm^3) (Page 3, lines 15-21). Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the invention was made, since it has been held that choosing the over lapping portion of the ranges taught by Anayama et al., and the range claimed by the applicant, has been held to be a *prima facie* case of obviousness, *see MPEP § 2144.05: Overlapping Ranges*.

Regarding claim 12, Hayashi et al. and Anayama et al. do not mention the specific densities of the neutron shielding material composition. However, Anayama et al. teach disclose employing a high density inorganic material (corresponding to the claimed density-increasing agent) with an overlapping range of density value in a neutron shielding material with optimum properties, such as higher density, improved shielding effect, greater mechanical strength and heat resistance (Page 3, lines 15-21). Since the resulting neutron shielding composition would obviously be affected by the density increasing agent, hence the density increasing agent is considered to be a result-effective variable. Therefore, the determination of the optimum or workable amount of the density-increasing agent to obtain the neutron shielding material composition with advantageous properties, including those claimed, is well within the skill of one ordinary in the art, *see MPEP § 2144.05, IIB*.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. (Machine Translation of JP 2003-50295) in view of Anayama et al. (EP 0 628 968) and as applied to claims 1-6 and 8-12 dabove, and further in view of Smith ("Can

Magnesium Be Extracted From Seawater." WiseGeek, Pages 1-2, 2003) or Admitted Prior Art (Page 17 of the Specification).

The disclosures with respect to Hayashi et al., Anayama et al. in paragraph 5 are incorporated here by reference. They do not specifically mention their magnesium hydroxide being obtained from sea water magnesium.

However, Smith suggests it is well known to extract magnesium from sea water, which can be formed into magnesium hydroxide useful for industrial processes (Page 1).

In addition, the applicants acknowledge on page 17 of the specification that magnesium hydroxide obtained from the sea water mangesium is commercially available.

Given the above teaching, it would have been obvious to one of ordinary skill in the art it is well known that magnesium hydroxide is obtained from the sea water magnesium as suggested by Smith for industrial processes. It would have been also obvious to use the commercially available magnesium hydroxide in the neutron shielding material.

Response to Arguments

7. The arguments filed 12/03/2008 are considered, but are not persuasive. Specifically, the applicants appear to argue that **A)** Hayashi and Anayama are silent about how to adjust the density of the composition in the system containing both the density-increasing agents and the refractory material (see Page 5 of the Applicants'

Remarks). The applicants rely on examples of Anayama for support. The applicants further argue **B)** their composition maintains the density-increasing agent have higher density than that of the refractory material.

With respect to argument **A)**, as mentioned in the previous office action, Anayama et al. disclose employing high density inorganic materials, corresponding to the claimed density-increasing agent, comprising metal powders, such as W, Mn, Fe, and Mn, having a density of at least 2.0 g/cm^3 or above, which overlaps with the claimed range, in a neutron shielding material composition to obtain a higher and more effective shielding effect on neutron rays (Page 3, lines 5-39). Anayama et al. also disclose that the high density inorganic materials will also produce shielding materials having optimum properties, such as greater mechanical strength and heat resistance (Page 10, lines 1-12). Thus, it would have been obvious to one of ordinary skill in the art to employ the density-increasing agents taught by Anayama et al. in a neutron shielding composition of Hayashi et al. containing the refractory index to obtain optimum shielding materials. Moreover, the claims are not limited to the examples of Anayama.

With respect to argument **B)**, Hayashi et al. and Anayama et al. teach their refractory materials and density-increasing agent are made of the same materials to those claimed. Anayama et al. also teach the density of the density-increasing agent has overlapping amount to that claimed. Since the refractory materials and density-increasing agents are made of identical materials to those claimed, there is a reasonable basis to believe that the density-increasing agent have higher density than

that of the refractory material. In any event, the densities of the refractory materials are well known to one of ordinary skill in the art. According to MPEP § 2112.01 [R-3], II,

> "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present."

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hannah Pak whose telephone number is (571) 270-

5456. The examiner can normally be reached on Monday - alternating Fridays (7:30 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hannah Pak
Examiner
Art Unit 1796

/HP/

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796